

SEQUENCE LISTING

<110> MCFADDEN, GRANT  
ESSANI, KARIM

<120> NUCLEIC ACID MOLECULES AND POLYPEPTIDES  
FOR IMMUNE MODULATION

<130> 50082/015002

<150> US 60/239,354  
<151> 2000-10-11

<160> 9

<170> FastSEQ for Windows Version 4.0

<210> 1  
<211> 26  
<212> PRT  
<213> Tanapox virus

<400> 1  
Ile Thr Leu Lys Tyr Cys Tyr Thr Val Thr Leu Lys Asp Asn Gly Leu  
1 5 10 15  
Tyr Asp Lys Val Phe Tyr Cys His Tyr Asn  
20 25

<210> 2  
<211> 338  
<212> PRT  
<213> Yaba Monkey tumor virus

<400> 2  
Met Asn Lys Leu Ile Leu Phe Ser Thr Ile Val Ala Val Cys Asn Cys  
1 5 10 15  
Ile Thr Leu Lys Tyr Asn Tyr Thr Val Thr Leu Lys Asp Asn Gly Leu  
20 25 30  
Tyr Asp Gly Val Phe Tyr Asp His Tyr Asn Asp Gln Leu Val Thr Lys  
35 40 45  
Ile Ser Tyr Asn His Glu Thr Arg His Gly Asn Val Asn Phe Arg Ala  
50 55 60  
Asp Trp Phe Lys Ile Ser Arg Ser Pro His Thr Pro Gly Asn Asp Tyr  
65 70 75 80  
Asn Phe Asn Phe Trp Tyr Ser Leu Met Lys Glu Thr Leu Glu Glu Ile  
85 90 95  
Asn Lys Asn Asp Ser Thr Lys Thr Ser Leu Ser Leu Ile Thr Gly  
100 105 110  
Cys Tyr Glu Thr Gly Leu Leu Phe Gly Ser Tyr Gly Tyr Val Glu Thr  
115 120 125  
Ala Asn Gly Pro Leu Ala Arg Tyr His Thr Gly Asp Lys Arg Phe Thr  
130 135 140  
Lys Met Thr His Lys Gly Phe Pro Lys Val Gly Met Leu Thr Val Lys  
145 150 155 160  
Asn Thr Leu Trp Lys Asp Val Lys Thr Tyr Leu Gly Gly Phe Glu Tyr

165	170	175
Met	Gly	Cys
Ser	Leu	Ala
Ile	Leu	Asp
Tyr	Gln	Lys
Met	Ala	Lys
180	185	190
Glu	Ile	Pro
Lys	Asp	Thr
Thr	Pro	Thr
Val	Lys	Val
Thr	Gly	Asn
210	215	220
Leu	Glu	Asp
Gly	Asn	Met
Met	Thr	Leu
Glu	Cys	Ser
Val	Asn	Ser
Phe	Tyr	
225	230	235
Pro	Pro	Asp
Val	Ile	Thr
Lys	Trp	Ile
Ile	Glu	Ser
Glu	His	Phe
245	250	255
Glu	Tyr	Lys
Tyr	Val	Asn
Gly	Arg	Tyr
Tyr	Pro	Glu
Trp	Gly	Arg
Gly	Arg	Lys
Ser	Asp	Tyr
Glu	Pro	Gly
Glu	Pro	Phe
Phe	Pro	Trp
Trp	Asn	Ile
Ile	Lys	Lys
260	265	270
Asp	Lys	Asp
Ala	Asn	Thr
Tyr	Ser	Leu
Thr	Asp	Leu
Leu	Val	Arg
Arg	Thr	Thr
275	280	285
Ser	Lys	Met
Ser	Ser	Gln
Leu	Val	Cys
Val	Val	Phe
His	Asp	Thr
Leu		
290	295	300
Glu	Ala	Gln
Val	Tyr	Thr
Cys	Ser	Glu
Gly	Cys	Asn
Gly	Glu	Leu
Tyr		
305	310	315
Asp	His	Leu
Tyr	Arg	Lys
Thr	Glu	Gly
Glu	Gly	Glu
Glu	Glu	Asp
325	330	335

Glu Asp

<210> 3  
<211> 1183  
<212> DNA  
<213> Yaba Monkey tumor virus

<400> 3  
atgaataagt taattttatc gttgtgggt tttgtggcaa cttgcaattt tataacctta 60  
agatataatt ataccgttac ggttaaagaat ggattatacg acggggattt ttttgattat 120  
tacaacgatc agtttagtaac gaggatatac tataaccatg aaacttagaca cggaaacgta 180  
aattcttagag cttcatggtt tgatatctct aaaaggccctc atactccggg tgacgattac 240  
caacttaact tttggtaccc gttaatgaaa gatactttgg agtccatcaa tagtaataaa 300  
aacgaaagcg ataaatgttc ttctgtgtcg ttaattttgg ggtgttatga aacgggatct 360  
cttttggga gttacggata cggttagtca agtggcggac cgtaggtcgtag gtatagcacg 420  
aaagataaaaa agtttttaaa aatgacagat aaaggatttca caaagggttgg aatgttaacc 480  
gttcatggtc ctatgtggca aacagttaaa aaatacgtgg gagggtttgg gtacgctgga 540  
tgtttgctag ctattttta ttatcaaaaa atggctaaga ataacatacc tagtaatgtta 600  
atgccaactg ttacggtaac gggtgaggaa ctgcaagatg gtaacacaac gtttaagtgt 660  
aacgtaaaaat ctttttaccc tccagacgtatgatcaagt ggatagaaag taaatatttt 720  
aacgtgtaat atagatacgt taatggaaaga gaataccggg aatggggaaag gcaatcagat 780  
tatgagcccg gagagccagg tttccgtt catccaaaaa aagatgacgg taaaaccact 840  
tacagccttt tagattttgg tcgcactacg tcaggattaa ctatgtcagtt agtttggtt 900  
gtttccatg acacgttta atcgcagggtt aatacatgtt ccgaagggtt gtaaggtaaa 960  
ttatacgtac acctatatacg aaaatcgaa gaaggagacg agttgtggaa ggacgaagaa 1020  
gactgaaaaac aagtctgtgtt ggaagctgtt ctgatcgcc gttacgttt ccgcgtacg 1080  
gaagttgcc gcccggagg gcgtatgttt ttttaaaaaaa tggaaaaagta gatgataccg 1140  
agcgatgacc gcgaaaatgga gtttattaca gacggcgtgt tcg 1183

<210> 4  
<211> 338  
<212> PRT  
<213> Tanapox virus

<400> 4  
Met Asn Lys Leu Ile Leu Phe Ser Thr Ile Val Ala Val Cys Asn Cys

1	5	10	15
Ile	Thr	Leu	Lys Tyr Asn Tyr Thr Val Thr Leu Lys Asp Asn Gly Leu
			20 25 30
Tyr	Asp	Gly	Val Phe Tyr Asp His Tyr Asn Asp Gln Leu Val Thr Lys
			35 40 45
Ile	Ser	Tyr	Asn His Glu Thr Arg His Gly Asn Val Asn Phe Arg Ala
			50 55 60
Asp	Trp	Phe	Lys Ile Ser Arg Ser Pro His Thr Pro Gly Asn Asp Tyr
			65 70 75 80
Asn	Phe	Asn	Phe Trp Tyr Ser Leu Met Lys Glu Thr Leu Glu Glu Ile
			85 90 95
Asn	Lys	Asn	Asp Ser Thr Lys Thr Thr Ser Leu Ser Leu Ile Thr Gly
			100 105 110
Cys	Tyr	Glu	Thr Gly Leu Leu Phe Gly Ser Tyr Gly Tyr Val Glu Thr
			115 120 125
Ala	Asn	Gly	Pro Leu Ala Arg Tyr His Thr Gly Asp Lys Arg Phe Thr
			130 135 140
Lys	Met	Thr	His Lys Gly Phe Pro Lys Val Gly Met Leu Thr Val Lys
			145 150 155 160
Asn	Thr	Leu	Trp Lys Asp Val Lys Thr Tyr Leu Gly Gly Phe Glu Tyr
			165 170 175
Met	Gly	Cys	Ser Leu Ala Ile Leu Asp Tyr Gln Lys Met Ala Lys Gly
			180 185 190
Glu	Ile	Pro	Lys Asp Thr Thr Pro Thr Val Lys Val Thr Gly Asn Glu
			195 200 205
Leu	Glu	Asp	Gly Asn Met Thr Leu Glu Cys Ser Val Asn Ser Phe Tyr
			210 215 220
Pro	Pro	Asp	Val Ile Thr Lys Trp Ile Glu Ser Glu His Phe Lys Gly
			225 230 235 240
Glu	Tyr	Lys	Tyr Val Asn Gly Arg Tyr Tyr Pro Glu Trp Gly Arg Lys
			245 250 255
Ser	Asp	Tyr	Glu Pro Gly Glu Pro Gly Phe Pro Trp Asn Ile Lys Lys
			260 265 270
Asp	Lys	Asp	Ala Asn Thr Tyr Ser Leu Thr Asp Leu Val Arg Thr Thr
			275 280 285
Ser	Lys	Met	Ser Ser Gln Leu Val Cys Val Val Phe His Asp Thr Leu
			290 295 300
Glu	Ala	Gln	Val Tyr Thr Cys Ser Glu Gly Cys Asn Gly Glu Leu Tyr
			305 310 315 320
Asp	His	Leu	Tyr Arg Lys Thr Glu Glu Gly Glu Gly Glu Asp Glu
			325 330 335
Glu	Asp		

<210> 5  
<211> 1034  
<212> DNA  
<213> Tanapox virus

<400> 5  
aagcttcatg aataagttaa tattat tag cacaattgt a gcagt tt gta actgcataac 60  
tttaaaat aattatactg ttacgttaaa agataatggg ttatacgtg gagtattta 120  
cgatcattac aacgatcagt tagaacgaa aatatcatat aaccacgaaa ctagacacgg 180  
aaacgtaaat tttagggctg atgggttaa tatttctagg agtccccaca cgccaggtaa 240  
cgattacaac tttaactttt ggtattctt aatgaaagaa actttagaaag aaattaataa 300  
aaacgatagc acaaaaaacta ctgcgtttc attaatcact gggtgttatg aaacaggatt 360  
attatgggt agttatgggt atgttagaaac ggccaacggg ccgtggcca gataccatac 420  
aggagataaa aggtttacga aaatgacaca taaaggttt cccaaagggtt gaatgttaac 480

tgtaaaaaac actcttgaa aagatgtaaa aacttatcta ggcgggtttg aatacatggg 540  
 atgttcatta gctatttttag attaccaaaa aatggctaaa ggtgaaatac caaaagatac 600  
 aacacctaca gtgaaagtaa cgggtaatga gttagaagat ggttaacatga ctcttgaatg 660  
 cagtgtaaat tcattttacc ctcctgacgt aattactaag tggatagaaa gcgaacattt 720  
 taaaggtgaa tataaatatg ttaacggaaatg atactatcca gaatggggga gaaaatccga 780  
 ttatgagcca ggagagccag gtttccatg gaatattaaa aaagataaaag atgcaaacac 840  
 atatagtttta acagatttag tacgtacaac atcaaaaatg agtagtcaac tagtatgtgt 900  
 tgtttccat gacacttttag aagcgcaagt ttatacttgt tctgaaggat gcaatggaga 960  
 gctatacgac cacctataata gaaaaacaga agaaggagaa ggtgaagagg atgaagaaga 1020  
 cgaaaaaccct cgag 1034

<210> 6  
 <211> 338  
 <212> PRT  
 <213> Yaba-like disease virus

<400> 6  
 Met Asp Lys Leu Leu Leu Phe Ser Thr Ile Val Ala Val Cys Asn Cys  
 1 5 10 15  
 Ile Thr Leu Lys Tyr Asn Tyr Thr Val Thr Leu Lys Asp Asp Gly Leu  
 20 25 30  
 Tyr Asp Gly Val Phe Tyr Asp His Tyr Asn Asp Gln Leu Val Thr Lys  
 35 40 45  
 Ile Ser Tyr Asn His Glu Thr Arg His Gly Asn Val Asn Phe Arg Ala  
 50 55 60  
 Asp Trp Phe Asn Ile Ser Arg Ser Pro His Thr Pro Gly Asn Asp Tyr  
 65 70 75 80  
 Asn Phe Asn Phe Trp Tyr Ser Leu Met Lys Glu Thr Leu Glu Ile  
 85 90 95  
 Asn Lys Asn Asp Ser Thr Lys Thr Ser Leu Ser Leu Ile Thr Gly  
 100 105 110  
 Cys Tyr Glu Thr Gly Leu Leu Phe Gly Ser Tyr Gly Tyr Val Glu Thr  
 115 120 125  
 Ala Asn Gly Pro Leu Ala Arg Tyr His Thr Gly Asp Lys Arg Phe Thr  
 130 135 140  
 Lys Met Thr His Lys Gly Phe Pro Lys Val Gly Met Leu Thr Val Lys  
 145 150 155 160  
 Asn Thr Leu Trp Lys Asp Val Lys Ala Tyr Leu Gly Gly Phe Glu Tyr  
 165 170 175  
 Met Gly Cys Ser Leu Ala Ile Leu Asp Tyr Gln Lys Met Ala Lys Gly  
 180 185 190  
 Lys Ile Pro Lys Asp Thr Thr Pro Thr Val Lys Val Thr Gly Asn Glu  
 195 200 205  
 Leu Glu Asp Gly Asn Met Thr Leu Glu Cys Thr Val Asn Ser Phe Tyr  
 210 215 220  
 Pro Pro Asp Val Ile Thr Lys Trp Ile Glu Ser Glu His Phe Lys Gly  
 225 230 235 240  
 Glu Tyr Lys Tyr Val Asn Gly Arg Tyr Tyr Pro Glu Trp Gly Arg Lys  
 245 250 255  
 Ser Asn Tyr Glu Pro Gly Glu Pro Gly Phe Pro Trp Asn Ile Lys Lys  
 260 265 270  
 Asp Lys Asp Ala Asn Thr Tyr Ser Leu Thr Asp Leu Val Arg Thr Thr  
 275 280 285  
 Ser Lys Met Ser Ser Gln Pro Val Cys Val Val Phe His Asp Thr Leu  
 290 295 300  
 Glu Ala Gln Val Tyr Thr Cys Ser Glu Gly Cys Asn Gly Glu Leu Tyr  
 305 310 315 320  
 Asp His Leu Tyr Arg Lys Thr Glu Glu Gly Glu Gly Glu Asp Glu  
 325 330 335

Glu Asp

<210> 7  
<211> 1017  
<212> DNA  
<213> Yaba-like disease virus

<400> 7  
atggataagt tactattatt tagcacaatt gtagcagttt gtaactgcatt aactttaaaa 60  
tataattata ctgttacgtt aaaagatgtat gggttatacg atggaggatt ttacgatcat 120  
tacaacgatc agttatgtac gaaaatatca tataaccatg aaactagaca cggaaacgtt 180  
aatttttaggg ctgattgggtt taatatttc aggagtcctt acacgccagg taacgattat 240  
aactttaact tttgggtattt ttaatgtaaa gaaacttttag aagaaaattaa taaaaacgtt 300  
agcacaaaaaa ctacttcgtt ttcattaatc actgggtgtt atgaaaacagg attattttt 360  
ggtatgtatg ggtatgtaga aacggccaac gggccgttg ccagatacca tacaggagat 420  
aaaaggttta cgaaaatgtac acataaaagggtt tttcccaagg ttgaatgtt aactgtaaaa 480  
aacactcttt gggaaagatgtt aaaagcttat ttaggcgtt ttgaatataat gggatgttca 540  
ttagcttattt tagattacca aaaaatggctt aaaggtaaaa taccaaaaga tacaacacct 600  
acagtgaaag taacgggtta tgagttagaa gatggtaaca tgactcttga atgcactgtt 660  
aattcatttt accctccttga cgttaattact aagtggatgtt aaagcgaaca ttttaaagggtt 720  
gaatataaat atgtaaacgg aagataactat ccagaatgggg ggagaaaatc caattatgag 780  
ccaggagagc cagggtttcc atgaaatatc aaaaagata aagatgcaaa tacatatagt 840  
ttaacagatt tagtacgtac aacatcaaaa atgagtagtc aaccagtatg tgggttttc 900  
catgacactt tagaagcgca agttataact tggctgttgaag gatgcaatgg agagctatac 960  
gatcacctt atagaaaaac agaagaagggg gaaggtgaag aggatgaaga agactgtt 1017

<210> 8  
<211> 340  
<212> PRT  
<213> Swinepox virus (C1L)

<400> 8  
Met Ile Thr Lys Ala Ile Val Ile Leu Ser Ile Ile Thr Ala Tyr Val  
1 5 10 15  
Asp Ala Ser Ala Phe Leu Val Tyr Asn Tyr Thr Tyr Thr Leu Gln Asp  
20 25 30  
Asp Asn His Arg Tyr Asp Phe Glu Val Thr Asp Tyr Phe Asn Asp Ile  
35 40 45  
Leu Ile Lys Arg Leu Lys Leu Asn Ser Glu Thr Gly Arg Pro Glu Leu  
50 55 60  
Arg Asn Glu Pro Pro Thr Trp Phe Asn Glu Thr Lys Ile Arg Tyr Tyr  
65 70 75 80  
Pro Lys Asn Asn Tyr Asn Phe Met Phe Trp Leu Asn Arg Met Ser Glu  
85 90 95  
Thr Leu Asp Glu Ile Asn Lys Leu Pro Glu Thr Ser Asn Pro Tyr Lys  
100 105 110  
Thr Met Ser Leu Thr Ile Gly Cys Thr Asp Leu Arg Gln Leu Gln Val  
115 120 125  
Asn Phe Gly Tyr Val Thr Val Gly Gly Asn Ile Trp Thr Arg Phe Asp  
130 135 140  
Pro Lys Asn Lys Arg Phe Ser Lys Val Arg Ser Arg Thr Phe Pro Lys  
145 150 155 160  
Val Gly Met Leu Thr Val Lys Ser Gln His Trp Glu Arg Val Met Glu  
165 170 175  
His Leu Gly Ser Met Val Thr Leu Thr Cys Pro Phe Thr Ala Asp Asp  
180 185 190  
Tyr Tyr Lys Ile Ser Lys Gly Tyr Ile Asp Lys Pro Val Lys Pro Thr

195	200	205	
Val Thr Val Thr Gly Ile Glu Arg Gly Asp Asn Thr		Thr Leu Ile Cys	
210	215	220	
Thr Phe Asp Asn His Tyr Pro Ser Ser Val Ala Val Lys Trp Tyr Asn			
225	230	235	240
Ile Glu Asp Phe Ala Pro Asp Tyr Arg Tyr Asp Pro Tyr Val Asn Glu			
245	250	255	
Leu Leu Pro Asp Thr Asp Tyr Leu Pro Gly Glu Pro Gly Tyr Pro Thr			
260	265	270	
Ile Thr Arg Arg Leu Gly Asp Lys Tyr Leu Phe Thr Ser Ser Pro Arg			
275	280	285	
Val Met Val Pro Thr Ile Met Ser Asn Arg Ile Ala Cys Val Gly Phe			
290	295	300	
His Ser Thr Leu Glu Pro Ser Ile Tyr Arg Cys Val Asn Cys Ser Gly			
305	310	315	320
Pro Glu Pro Val Leu Gln Gly Asp Arg Arg Asn Asp Leu Glu			
325	330	335	
Asp Glu Glu Asp			
340			

<210> 9  
 <211> 1023  
 <212> DNA  
 <213> Swinepox virus (C1L)

<400> 9  
 atgattacta aaggcattgtt gatattgtctt attattacag catatgtaga tgcttccgca 60  
 ttcttagtat acaaattatac atatacttta caagatgata atcatcgata tgacttcgaa 120  
 gtcaccgatt attttaatga tatactaata aaacgtttaa aactaaatag cgagacagga 180  
 agaccagaat taagaaaatga accaccaaca tggtttaatg agactaagat tagatattat 240  
 ccgaaaaata attataattt tatgttctgg ctaaatagaa tgagtgaaac gctagatgag 300  
 ataaaataaac ttccagaaac gagtaatcct tacaagacta tgcccttgac aattggatgt 360  
 actgatctaa gacaactcta agttaatttgc ggttatgtta ctgttaggtgg taatataatgg 420  
 acacgattcg accccaagaa taaacgcttt agttaaagttt gatcacgtac atttccaaag 480  
 gtaggaatgtt taactgttaa atcacaacac tgggaacgtg ttatggaaaca tcttggatca 540  
 atggtaacat taacatgtcc gtttacagcg gatgatttataatatttc taagggatat 600  
 atagataagc cagtttaagcc tactgttaca gttacaggaa ttgaaaagagg agataataact 660  
 acattgatat gcacatttga taatcattat ccgtcgtcgg tcgctgttaa atggtataac 720  
 atcgaggact ttgctccgga ctatcggtt gatccgtacg taaatgaatt gcttcctgat 780  
 acggactatc taccgggtga accaggatataatccgactataa ctaggagatt aggtgataaa 840  
 tatttattta catcatcacc tagggttatg gtaccaacta tcattgtctaa tagaatagca 900  
 tgtgttggat ttcatagtagc gttagaacca agcatatata gatgtgtaaa ctgctcggga 960  
 cctgagcctg ttttacaata ccagggagat agaaggaatg acttggagga tgaggaggat 1020  
 taa 1023